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Research Concerning Myxosporidia Parasitic on the Nervous Tissue of p. 16
Yamame and Amago-II

(Distribution and time of appearance of fish parasitized by sporidia in Hiroshima Prefecture)

Myxosporidia parasitic on nervous tissue were discovered in fish suffering from yamame and amago sleeping sickness (provisional

appellation), and are suspected of being the cause of the sleeping sickness. By such means as the anatomical examination of diseased fish, however, no evidence was found on the basis of which the cause could be conclusively determined. Accordingly, the occurrence of spores at the infected fish farms was examined, classified by time of occurrence, amago and yamame caught at salmon farms and in rivers in the prefecture where the sleeping sickness has not been observed were examined to determine whether or not spores were present, and an attempt was made to shed light on the distribution of the spores.

## Experimental

For the determination of the occurrence of spores, yamame (in their first year of life) reared at salmon farms where the sleeping sickness has been observed were examined once per week from April 17 until the onset of the disease. Thereafter a survey was conducted once per month on five fish. For the determination of the distribution of the spores, both cultured amago and yamame and those found in rivers were obtained at various places in July and August, and their bodies were examined. The survey method involved the examination of smears prepared from the medulla and the head (cranial nerves).

## Results

### 1. Time of Appearance of Mature Spores

As a result of an examination to determine the occurrence of spores in yamame in their first year of life, the presence of mature spores was not confirmed until the sleeping sickness was observed, but mature spores were observed in roughly 100% of the surviving fish on the 13th day after the onset of the disease, and also in the

examinations carried out once per month thereafter, the presence of spores was confirmed in 100% of the fish.

2. Distribution of Fish Parasitized by Spores

As a result of examinations carried out in July and August on yamame and amago at 11 salmon farms in the prefecture, as shown in the figure below, the presence of spores was confirmed at five salmon farms. These were in all cases ponds using water from rivers in the upper reaches of which yamame and amago live. The salmon farms where the presence of sporidia was not confirmed were one farm using spring water and five ponds using water from mountain streams in the upper reaches of which no yamame or amago live.

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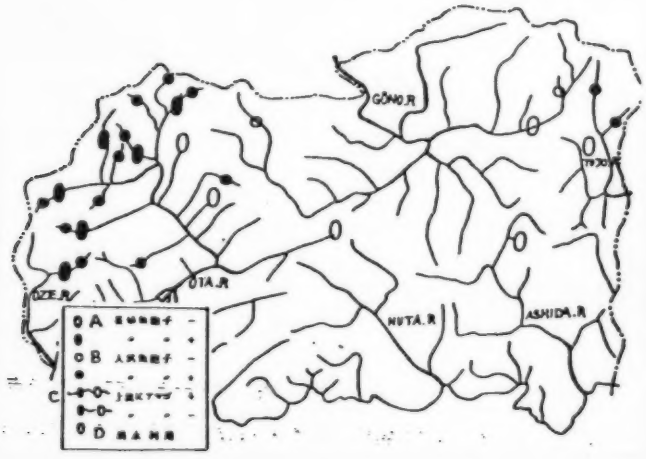


Map of Distribution of Myxosporidia Parasitic on Yamame and Amago in Hiroshima Prefecture

Key: A. Spores in cultured fish, B. Spores in captured fish, C. Amago in upper reaches of river, D. Spring water used.

The results of examinations of amago and yamame obtained from rivers at 13 locations along six water systems in the prefecture are shown in the above figure. The water systems in which sporidia were observed were the Oze River, the Ōta River and the Takahashi River. In the Gōno River water system, because there are few places in which yamame live, only two places were surveyed, but in neither place were sporidia observed.

## Discussion

Because of the fact that the time of the onset of the sleeping sickness roughly coincides with the time of the appearance of mature spores, the fact that there is a correlation between the distribution of fish parasitized by spores in rivers and the existence of parasitization by spores in cultured fish, and the fact that the water systems in which fish parasitized by sporidia were observed flow into the Japanese Inland Sea, whereas the Gōno River, in which the presence of fish parasitized by sporidia was not confirmed, flows into the Sea of Japan, these three facts are believed to be interrelated. Because the quantity of survey data is limited, however, no conclusions can be drawn.

(person in charge: Murakami)